

Appendix 8 – Personal Protective Equipment Analysis Summary

This report is based on witness statements, examination of the entrapment site, and the examination of the equipment found at the entrapment site from October 28 to October 30, 2006.

Based on a witness statement and the examination of the limited amount of clothing available, it appears the victims were wearing appropriate and required personal protective clothing and equipment (PPE). Although much of the PPE was severely damaged in the fire, there is no indication that the PPE was not serviceable prior to the turnover. It appears that the PPE was subjected to high temperatures and significant direct flame exposure, conditions that far exceed the design limitations of the clothing.

Five New Generation (M-2002) fire shelters were found, one in the vicinity of each victim. An additional New Generation fire shelter was found in a storage compartment of Engine 57. None of the shelters were deployed.

Engine Site:

Two victims were found at this site. This site was exposed to high intensity, long duration heat produced by the vegetative flame front and the ensuing vehicle fire. Vehicles involved at the site were Fire Engine 57, a small car, and a small tractor. Two fire shelters were found on the ground, one near each victim.

One of the shelters was accordion folded in the same shape in which it was packaged. Much of the aluminum foil of the shelter had melted away. Aluminum melts when it reaches 1220 degrees Fahrenheit. Much of the fiberglass in the shelter was brittle indicating temperatures of at least 1350 degrees Fahrenheit (F).

The second fire shelter that was next to the engine was slightly unfolded. Some of the silica cloth was brittle and some of the fiberglass of the shelter had melted away indicating temperatures of at least 1610 degrees F.

The fire shelter present in the engine's driver side storage compartment was folded in the same shape in which it was packaged. Much of the silica cloth was brittle and much of the fiberglass of the shelter melted away indicating temperatures at least 1610 degrees F.

Road Site:

Two victims were found at this site. Some line pack items were found above the road indicating the firefighters may have moved from above the road to this site.

Three fire shelters were found at this site. The first shelter was found in its polyvinyl chloride (PVC) bag and hard plastic liner with no pack; the second shelter was found adjacent to a line pack in its PVC bag and hard plastic liner; and the third shelter was found within a melted mass of a line pack. A radio inside the melted pack was still functioning when examined.

The equipment found at the Road Site showed signs of high heat exposure. The line packs found at this site were mostly melted into a mass. Nylon material used in packs melts at 410 degrees F. The hard hat found at the site was a melted mass. Hard hats melt at 450 degrees F. The two leather gloves found had shrunk significantly and stiffened, shrinkage occurs at about 600 degrees F. Only a small amount of Nomex clothing was found, it appears much of the victims' clothing was burned away. Nomex chars at 824 degrees F.

Below Road Site:

Another victim was found just below the Road Site. Little evidence was present at this site. Much of the clothing and line pack was burned away indicating a temperature exposure of at least 824 degrees F.